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Your ref:

Date: 2 August 2004

BY FACSIMILE AND POST

International Preliminary Examining Authority
European Patent Office
Erhardtstrasse 27
D-80331 Munich
GERMANY

Dear Sirs

International Patent Application No PCT/GB03/02796
Reckitt Benckiser (UK) Limited et al

We write in response to the Written Opinion dated 2 April 2004. The Examiner is thanked for granting the applicant a one month extension to the time limit for replying.

In response to the Written Opinion, we enclose new pages 2, 8, 9, 10, 11, 12 and 13 to replace those pages originally on file. For the assistance of the Examiner, we also enclose those original pages showing the proposed amendments in manuscript.

Claim 1 has been amended to include the limitation of claim 2. Corresponding amendments have been made to the description. Claim 4 has been deleted and subsequent claims re-numbered accordingly.

Throughout the text, the symbol 'EC' has been replaced by '°C'. The symbol 'EC' appears through clerical error and basis for this correction can be found on page 3, lines 7-9.

Novelty

Claim 2 is acknowledged by the Examiner to be novel. Therefore, the inclusion of the limitation of claim 2 into claim 1 renders the claim novel. All subsequent claims are dependent on claim 1 and are therefore novel.

Inventive Step

The Examiner has not objected to the inventiveness of claim 2. The combination of claims 1 and 2 must therefore be both novel and inventive. The dependency of all the remaining claims renders them both novel and inventive.

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It is believed that it would now be appropriate to issue a clear International Preliminary Examination Report.

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Yours faithfully
RECKITT BENCKISER plc

John C McKnight

Enc

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The post burning aesthetics of a candle should also be good; that is, the residual wax should not have a burnt appearance.

Other important criteria include the melting point of the wax. This is ideally around 50°C, for example, from about 45°C to about 55°C. If the melting point is lower than this then a problem of stability can arise in warmer countries but if the melting point of the wax is higher than this, in the case where the candle contains a fragrance or other air-borne agent it is not so easily released because the higher melting waxes hold on to the fragrance too effectively. An additional consideration is that higher melting point waxes tend not to burn so well and tend to leave more residue on the glass container. Also generally, Low Melting Point waxes shrink less than higher Melting Point waxes.

The present invention relates to the concept of producing a paraffin wax composition which produces an optimum combination of all or most of the criteria mentioned above. In particular, it has been discovered that a wax composition which comprises a mixture of a relatively hard paraffin wax with a relatively soft paraffin wax enables the composition to more closely fulfil or approach an optimum combination of the criteria which are explained above.

Specifically, the present invention provides a paraffin wax candle composition comprising a mixture of a hard paraffin wax and a soft paraffin wax the hard wax having a penetration value as measured by the Needle Penetration Test as defined in ASTM D 1321 of 16-20 and the soft wax having a penetration value of no less than 45, the composition itself having a penetration value between 30 and

TABLE

Composition	Paraffin 5203 Solid saturated Hydrocarbons C_nH_{2n+2}	Paraffin 6214 Solid saturated Hydrocarbons C_nH_{2n+2}	Paraffin 6213 Solid saturated Hydrocarbons + Triglyceride < 25%
CAS No.	64742-51-4, 8002-74-2	64742-51-4	Paraffin: 64742-51-4, 8002-74-2 Triglyceride: 84540-04-5
EINECS No.	266-154-5, 232-315-6	265-154-5	Paraffin: 265-154-5, 232-315-6 Triglyceride: 283-093-2
Physical Description	At 20°C, waxy solid	At 20°C, waxy solid	At 20°C, waxy solid
Colour	White	Whitish	White / Whitish
Odour	Practically odourless	Practically odourless	From neutral to slightly fatty like
Congealing point	52-54°C	48-52°C	42-46°C
Penetration test at 25EC (dmm)	16-20	50-70	70-100
Flash point	>150°C	>150°C	>150°C
Viscosity (100EC)	2.5-10 mm ² /s	4.0-6.0 mm ² /s	4.0-5.0 mm ² /s
CAS No. 64742-51-4/Synonyms..Paraffin waxes, petroleum, hydrotreated			
CAS No. 8002-74-2/Synonyms ...Paraffin Wax; Paraffin waxes: Paraffin wax (petroleum); Poly(methylene)wax; Wax extract; Paraffin wax fume; Fischer- tropsch wax; Cream E45; Derma-Oil; Duratears; Granugen; Parachoc; Replens; Paraffin Wax, granular;			

It should be noted that all three paraffins appear to be fairly similar but differ significantly in some of their physical properties, in particular the penetration values and also their congealing points, the latter it will be seen being appropriate to provide a melting point of the overall composition around 50°C as explained hereinbefore.

As a specific example of a candle composition in accord with the present invention the proportion of ingredients are set out below.

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Candle Composition

% by weight
per mix

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Core Composition

Paraffin 5203	99.898
Pigment Ivory 15-1641	0.1
Pigment Cobrizo 29-627	0.002

Wax Composition

Paraffin 6214	65.64
Paraffin 5203	28.20
Fir Vanilla Light 175297E	5.41
Microcrystalline Wax 1800	0.65
Pigment Ivory 15-1641	0.09
Pigment Cobrizo 29-627	0.01

30

The proportion by weight of the Core composition to the wax composition is approximately 26:74.

The invention will be illustrated by the following Example:

Method of Manufacture of the Candle

5 1) Core Production and wicking

The appropriate amount of paraffin 5203 is weighed into a mixing tank. The appropriate amounts of the pigment ivory and pigment cobrizo dyes are then added to the same tank.

10 The tank temperature is maintained at 60 to 65°C whilst the contents of the tank are stirred until the dye has melted and completely dispersed.

The resulting coloured liquid wax is then fed to a spraying
15 drum feed tank. The powder is sprayed and pumped via pipes to a powder press.

The appropriate wick is loaded into a wicking machine adjacent to the powder press. The specified length of wick
20 is automatically inserted on line through the core and a metal sustainer is secured to the end.

2) Wax Blend

25 The appropriate amounts of Paraffin 5203, Paraffin 6214 and microcrystalline wax are transferred to a mixing vessel. The vessel temperature is maintained at approximately 65°C whilst the mixture is stirred until all components have been fully melted and dispersed.

The appropriate amounts of Pigment Ivory, Pigment Cobrizo and Fir Vanilla Light are then added to the mixing vessel. The vessel temperature is maintained at a temperature of from 60 to 65°C until the dye has completely melted and has
5 been dispersed in the mixture.

3) Filling Line

The wick assembly/coloured core is transferred into
10 a glass jar. The glass jar is heated to 55 to 60°C by passing the glass jar through a glass heater.

The glasses are then filled with the wax blend via calibrated filling heads.

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The filled glasses are then passed through a cooling tunnel and then an infra red "Flash" heater, which removes air bubbles and smoothes the wax surface.

20 The glasses are then passed through a second cooling unit.

CLAIMS

1. A paraffin wax candle composition comprising a mixture of a hard paraffin wax and a soft paraffin wax the hard wax having a penetration value as measured by the Needle Penetration Test as defined in ASTM D 1321 of 16-20 and the soft wax having a penetration value of no less than 45, the composition itself having a penetration value between 30 and 50.
2. A composition as claimed in claim 1 wherein the soft wax has a penetration value of 50-70.
3. A composition as claimed in any one of the preceding claims wherein the proportion by weight of the soft wax to the hard wax is in the range 50:50 to 90:10.
4. A composition as claimed in claim 3 wherein the proportion by weight of the soft wax to the hard wax is about 70:30.
5. A composition as claimed in any one of the preceding claims wherein the melting point of the composition is in the range from 45°C to 55°C.
6. A composition as claimed in claim 5 wherein the melting point of the composition is about 50°C.
7. A composition as claimed in any one of the preceding claims which contains a microcrystalline wax in an amount up to 1% by weight.

8. A composition as claimed in any one of the preceding claims which contains a polyethylene in an amount up to 1% by weight.

5 9. A composition as claimed in any one of the preceding claims which contains a colouring material in an amount up to 0.5% by weight.

10 10. A composition as claimed in any one of the preceding claims which contains a fragrance and/or other air-borne agent or agents in an amount up to 10% by weight.

11. A candle comprising a composition as claimed in any one of the preceding claims.

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12. A candle as claimed in claim 11 comprising a container in which the candle composition in a liquid state has been poured and set surrounding a candle wick.



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1 PCT/GB03/02796	11057P1 WO/JM	Letter dated 2 August 2004
2		New pages 2, 8-13
3		Manuscript pages 2, 8-13
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